

ATTACHMENT A

Remarks

Claims 1, 3, 4 and 5 have been objected to because of certain informalities concerning the unintended use therein of a two sentence form. These claims have been amended to overcome the objection raised.

Claims 1-11, 13-16, 18, 19 and 21 have been rejected under 35 USC 102(e) as being "anticipated by" the Dempsey et al patent. This rejection is respectfully traversed although independent claims 1 and 13 have been amended to include a portion of the subject matter of claims 11 and 19, respectively.

Turning to the Dempsey et al patent, this patent discloses a device in which a signal representing a physiological condition of a patient is used to modulate an electromagnetic signal received by a transponder so that a modulated electromagnetic signal representative of the original signal is re-radiated by the transponder. However, this patent does not address problems of phase cancellation. These problems, in accordance with the present invention, are addressed by the provision of a simple spread spectrum approach as defined in claims 11 and 19 as filed.

The Examiner contends that this feature of claim 11 (and the corresponding feature of method claim 19) is disclosed by the Dempsey et al patent at column 4, lines 13-59. It is respectfully submitted that this contention is not well taken. The pertinent portion of the passage to which the Examiner refers discloses that "the re-radiated rf signal may be mixed with an analog signal representing a physiological condition to produce a frequency modulated (FM) signal, may be modulated using known phase-modulation (PM) techniques, or may be modulated in any other manner known to those skilled in the art" (see column 4, lines 23-28). However, it is clear that this passage merely refers to FM, PM and modulation "in any other manner known to those skilled in the art" and there is no explicit disclosure of the modulation technique defined in amended claims 1 and 13 with respect to varying the frequency or phase of the reference signal so that the reference signal is a spread spectrum reference signal.

In any event, the modulations referred to in this passage of the reference are performed on the re-radiated RF signal, i.e., the signal sent back from the "leadless monitoring device" 20 to the transmitter 24. The Dempsey et al patent does not

disclose a system wherein such signal modulations are performed on the reference signal before that signal is received and modulated according to the signal representing a physiological condition of the patient. The approach provided in accordance with the present invention results in the reference signal being a spread spectrum reference signal, thereby addressing the potential problems of phase cancellation.

In summary, it is respectfully submitted that the amendments made to claims 1-13, which include the feature discussed above and which set forth the purpose of the form of modulation employed, clearly distinguish the present invention from the Dempsey et al patent and are patentable over that patent.

Referring to some of the dependent claims, it is noted that claim 17 has been rejected over the Dempsey et al patent in view of the Schulze et al patent while claims 12 and 20 have been rejected over the Dempsey et al patent in view of the Burrows patent. It is respectfully submitted that neither of these rejections are well taken and that the disclosures of the secondary references would not be combined with that of the primary reference in the manner suggested by the Examiner.

Considering the latter point in more detail, the Schulze et al patent discloses a system which employs conventional cellular or other wireless technology, and hence the remote unit disclosed therein (MVPM12) comprises a conventional active transmitter system. Similarly, the system of the Burrows patent uses an active remote transmitter 12.

In contrast, the apparatus of the present invention concerns a passive retransmission means "for passively retransmitting said modulated reference signal to said base station" (claim 1), and the method of the present invention includes "passively retransmitting said modulated reference signal from said biological monitoring probe to said base signal" (claim 13). It is respectfully submitted that one of ordinary skill in the art would not look to nor rely on teachings solely concerning active retransmission systems in attempting to improve the system of the Dempsey et al patent and somehow arrive at the present invention as claimed. Thus, it is respectfully submitted that dependent claims 12, 17 and 20 are patentable for this reason as well.

Finally, with respect to claim 6, this claim has been amended to replace the phrase "may use" with the more positive recitation "uses," and claim 14 has been

amended to bring the terminology thereof into line with the other claims. Claim 11-19 have been amended in view of the amendments made to parent claims 1 and 13, and a new claim 22 has been added which is directed to a portion of claim 19 that has been deleted.

Allowance of the application in its present form is respectfully solicited.

ATTACHMENT B

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) Apparatus for physiological monitoring of a remote subject including:

a base station having a transmission means for transmitting a reference signal;
and

at least one physiological monitoring probe connectable to said subject, said physiological monitoring probe or probes having:

receiver means for receiving said reference signal;

monitoring means for monitoring said subject and generating a condition signal containing information related to a condition or conditions of said subject;

intermediate signal means for generating an intermediate signal derived by combining said condition signal with a fixed or varying frequency sub-carrier signal before modulating said reference signal;

modulation means for modulating said reference signal with said intermediate signal to produce a modulated reference signal containing said information contained in said condition signal; and

passive retransmission means for passively retransmitting said modulated reference signal to said base station;

wherein said base station has means for receiving said modulated reference signal, and means for demodulating said modulated reference signal to obtain said information related to one or more conditions of said subject so that one or more conditions of said subject can be monitored at said base station, ~~and wherein said physiological monitoring means includes intermediate signal mean for generating an intermediate signal. Derived by combining said condition signal with a fixed or varying frequency signal before modulating said reference signal~~ and said base station is operable to vary the frequency or phase of the reference signal so that said reference signal is a spread spectrum reference signal.

2. (Original) Apparatus as claimed in claim 1, wherein said receiving means and passive retransmission means are a passive radio transponder.

3. (Currently Amended) Apparatus as claimed in ~~claim 1~~claim 1, wherein said monitoring means includes a physical parameter transducer.

4. (Currently Amended) Apparatus as claimed in ~~claim 1~~claim 1, wherein said monitoring means includes a biological electrode.

5. (Currently Amended) Apparatus ~~as~~as claimed in claim 1, wherein said intermediate signal means is operable to convert analog and/or digital signals from the monitoring means to an intermediate signal which is used to modulate a radio frequency signal received by a passive radio transponder, so ~~that~~that the transponder automatically retransmits a modulated signal which contains information relating to the condition of the subject.

6. (Currently Amended) Apparatus as claimed in claim 1, wherein said passive radio transponder ~~may use~~uses a plurality of intermediate signals to modulate a radio frequency reference signal.

7. (Previously Presented) Apparatus as claimed in claim 1, wherein said base station includes analog and/or digital outputs for outputting data.

8. (Currently Amended) Apparatus as claimed in claim 1, wherein said base station is connectable to a computer network, and operable to receive input and output ~~data via~~data via said computer network.

9. (Previously Presented) Apparatus as claimed in claim 1, including encryption means so that said apparatus can transmit and/or receive data in encrypted form.

10. (Previously Presented) Apparatus as claimed in claim 1, wherein said condition signal includes a synchronous or an asynchronous data signal.

11. (Currently Amended) Apparatus as claimed in claim 1, wherein said base station is operable to ~~use either a fixed frequency reference signal or~~ vary the frequency or phase of the reference signal by a continuously varying signal having an instantaneous value that determines the respective instantaneous frequency or phase.

12. (Currently Amended) Apparatus as claimed in claim 11 in which the continuously varying signal is derived from a Pseudo-Random Binary Sequence.

13. (Currently Amended) A method of physiological monitoring of a remote subject including:

transmitting a reference signal from a base station to at least one remote physiological monitoring probe connected to a subject;

varying the frequency or phase of said reference signal so that said reference signal is a spread spectrum reference signal;

monitoring said subject and generating a condition signal containing information related to a condition or conditions of a said subject;

generating an intermediate signal derived by combining said condition signal with a fixed or varying frequency sub-carrier signal;

modulating said reference signal with said intermediate signal to produce a modulated reference signal containing said information contained in said condition signal;

passively retransmitting said modulated reference signal from said biological monitoring probe to said base station; and

demodulating said modulated reference signal to obtain said information related to the condition or conditions of said subject so that the condition or conditions of said subject can be monitored at said base station.

14. (Currently Amended) A method as claimed in claim 13, wherein said intermediate signal is one of a plurality of intermediate signals, and said fixed or varying frequency sub-carrier signal includes one of a plurality of sub-carrier signals, each corresponding to a respective one of said plurality of intermediate signals.

15. (Previously Presented) A method as claimed in claim 13 further including converting analog and/or digital signals from a subject monitoring means to the intermediate signal which is then used to modulate a radio frequency signal received by a passive radio transponder, whereby the transponder automatically retransmits a modulated signal containing information relating to the condition of the subject.

16. (Previously Presented) A method as claimed in claim 13, including transmitting data from said base station over a computer network, and/or inputting data over a computer network.

17. (Previously Presented) A method as claimed in claim 13, including encrypting data to be output by said base station, and/or encrypting said modulated reference signal.

18. (Previously Presented) A method as claimed in claim 13, including transmitting said condition signal as a synchronous or an asynchronous data signal.

19. (Currently Amended) A method as claimed in claim 13, including ~~fixing~~varying the frequency or phase of the reference signal ~~or varying the frequency or phase of the reference signal~~ by a continuously varying signal having an instantaneous value that determines the respective instantaneous frequency or phase.

20. (Currently Amended) A method as claimed in claim 19 in which the continuously varying signal is derived from a Pseudo-Random Binary Sequence.

21. (Previously Presented) A method-as claimed in claim 13, wherein said method is used to monitor sleep apnoea.

22. (New) Apparatus as claimed in claim 1, wherein said base stations is also operable to use a fixed frequency reference signal.